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Guide to the Preparation of Solid Waste Management Plans by Regional Districts

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GUIDE TO THE PREPARATION OF SOLID WASTE MANAGEMENT PLANS BY REGIONAL DISTRICTS

MUNICIPAL SOLID & BIOMEDICAL WASTE BRANCH

ENVIRONMENTAL PROTECTION DIVISION

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TABLE OF CONTENTS

SECTION	TITLE	PAGE
	Preface	1
PART 1	**INTRODUCTION**	
1.1	PURPOSE AND ORGANIZATION	2
1.2.	DEFINITIONS	2
1.3	LEGISLATIVE AUTHORITY FOR SOLID WASTE MANAGEMENT PLANNING	
1.3.1	REGIONAL DISTRICTS	3
1.3.2	MUNICIPALITIES	4
1.3.3	JURISDICTIONAL OBJECTIVE	4
1.4	PLANNING ROLES AND COOPERATION	4
1.5	FINANCIAL ASSISTANCE PROGRAMS	5
PART 2	**PROCEDURES FOR DEVELOPING AND ADOPTING REGIONAL SOLID WASTE MANAGEMENT PLANS**	
2.1	PURPOSE	7
2.2	PUBLIC INVOLVEMENT PROCESS	7
2.3	DECISION TO PREPARE A REGIONAL SOLID WASTE MANAGEMENT PLAN	8
2.4	NOTIFICATION OF PROVINCIAL AGENCIES	8
2.5	ESTABLISHMENT OF SOLID WASTE ADVISORY COMMITTEES	9
2.5.1	LOCAL SOLID WASTE ADVISORY COMMITTEE	9
2.5.2	TECHNICAL SOLID WASTE ADVISORY COMMITTEE	10
2.6	ORGANIZATION OF PLANNING STUDIES	10
2.7	APPLICATION FOR FINANCIAL ASSISTANCE	10
2.8	STAGE 1: WASTE MANAGEMENT SYSTEM / OPTIONS	10
2.9	STAGE 2: EVALUATION OF OPTIONS	11
2.10	STAGE 3: PLAN PREPARATION AND ADOPTION	
2.10.1	PLAN PREPARATION	11
2.10.2	MINISTERIAL APPROVAL	12
2.10.3	PLAN ADOPTION	12
2.11	IMPLEMENTATION	12
2.12	APPROVAL OF IMPLEMENTATION MEASURES	12

PART 3 CONTENT GUIDELINES FOR REGIONAL SOLID WASTE MANAGEMENT PLANS

3. PURPOSE 16

STAGE 1 SOLID WASTE MANAGEMENT SYSTEM / OPTIONS

4. PLAN AREA
4.1 GEOGRAPHIC AREA / LOCATION / PARTICIPANTS 16
4.2 OFFICIAL PLAN DESIGNATIONS 16
4.3 POPULATION 17
4.4 ECONOMIC BASE 17
4.5 PHYSICAL DESCRIPTION / CONSTRAINTS 17

5. EXISTING SOLID WASTE MANAGEMENT SYSTEM
5.1 CHARACTERISTICS OF SOLID WASTE STREAM 17
5.2 COLLECTION SYSTEM 18
5.3 POST-COLLECTION SYSTEM
5.3.1 OPERATIONS DESCRIPTION 18
5.3.2 ADMINISTRATIVE AND FINANCIAL STRUCTURE 19
5.4 REGIONAL SOLID WASTE MANAGEMENT ISSUES 19

6. SOLID WASTE MANAGEMENT OPTIONS
6.1 DESCRIPTION OF OPTIONS 19
6.2 OPTIONS RECOMMENDED FOR STAGE 2 EVALUATION 20

STAGE 2 EVALUATION OF OPTIONS

7. DETAILED EVALUATION OF OPTIONS
7.1 PROMOTIONAL AND EDUCATION PROGRAMS 20
7.2 REDUCTION AND REUSE 21
7.3 RECYCLING
7.3.1 SOLID WASTE STREAM TARGETS 21
7.3.2 RESPONSIBILITY 23
7.3.3 COLLECTION SYSTEMS 23
7.3.4 PROCESSING AND SHIPPING SYSTEMS 24
7.3.5 MARKETING SYSTEM 24
7.3.6 INVOLVEMENT WITH INDUSTRY, ADJACENT JURISDICTIONS AND OTHER LEVELS OF GOVERNMENT 25
7.3.7 FINANCIAL EVALUATION 25
7.3.8 PHASING SCHEDULE 25
7.3.9 IMPACTS 25
7.4 RECOVERY
7.4.1 JUSTIFICATION 25
7.4.2 TARGETS, TECHNOLOGY, LOCATION AND MARKETS 26
7.4.3 RESPONSIBILITY 26

7.4.4	INVOLVEMENT WITH INDUSTRY, ADJACENT JURISDICTIONS AND OTHER LEVELS OF GOVERNMENT	26
7.4.5	FINANCIAL EVALUATION	26
7.4.6	PHASING SCHEDULE	26
7.4.7	IMPACTS	27
7.5.	RESIDUAL MANAGEMENT	
7.5.1	SITE EVALUATION	27
7.5.2	RESPONSIBILITY	27
7.5.3	THERMAL TREATMENT	27
7.5.4	COLLECTION / TRANSFER SYSTEM	28
7.5.5	INVOLVEMENT WITH INDUSTRY, ADJACENT JURISDICTIONS AND OTHER LEVELS OF GOVERNMENT	28
7.5.6	FINANCIAL EVALUATION	28
7.5.7	PHASING SCHEDULE	29
7.5.8	IMPACTS	29
7.5.9	MONITORING DISPOSAL OF SOLID WASTE	29
7.6.	FINAL REPORT	29

STAGE 3 PLAN PREPARATION AND ADOPTION

8.	PROVINCIAL GOAL AND STRATEGY	
8.1	PROVINCIAL REDUCTION GOAL	29
8.2	EXPLANATION OF 5R STRATEGY	30
9.	SOLID WASTE STEAM TARGETS AND MANAGEMENT STRATEGIES	31
10.	OPERATIONAL PLANS	32

FIGURES

1	Stage 1:	Waste Management System/Options	13
2	Stage 2:	Evaluation of Options	14
3	Stage 3:	Plan Preparation and Adoption	15

PREFACE

On August 10, 1989, Bill 58, The Waste Management Amendment Act, 1989, was passed, which required that Regional Districts submit a solid waste management plan on or before December 31, 1995. On September 13, 1989, Cabinet endorsed the **Municipal Solid and Biomedical Waste Management Strategy** which calls for reducing the amount of municipal solid waste requiring disposal by 50 percent by the year 2000. The essential part of the strategy is the sequential hierarchy of the 5 R's: reduce, reuse, recycle, recovery and residual management. The Municipal Solid and Biomedical Waste Branch has been established within the Environmental Protection Division of the Ministry of Environment to implement this strategy.

The first phase of the Strategy includes the following main elements:

Partnership with People - Environmental Education
Partnership with Business - Market Development
Partnership with Local Government - Planning

As part of the third element, funding assistance is available for the preparation of the regional solid waste management plans (RSWMP's) required by Section 16.1 of the Waste Management Act. An underlying purpose of this Guide is to assist regional districts and municipalities in deriving maximum benefit from the planning assistance contribution programme.

The Ministry of Environment wants to work with local governments to restructure the way we produce and manage municipal solid waste, thereby creating a sustainable, integrated waste management system. The Ministry is therefore prepared to assist regional districts and municipalities in preparing, adopting and implementing RSWMP's.

Because of the waste management plans which had already commenced at the time Bill 58 was passed and more which have since been initiated, there was a need to issue this Guide as soon as possible. As a result, the draft Guide did not receive the benefit of as wide a review as the Ministry would have preferred. The Ministry is therefore open to suggestions for improving the Guide as a result of the early experience of using it, and particularly welcomes suggestions for additional or more detailed direction that would be helpful to local governments.

PART 1 INTRODUCTION

1.1 PURPOSE AND ORGANIZATION

This Guide is intended to assist regional districts in preparing Regional Solid Waste Management Plans (RSWMPs) which comply with the requirements of the *Waste Management Act* and Regulations, including the *Requirements for Regional Solid Waste Management Plans* . Except for the requirement of adopting the 5R hierarchy as the basis of the Plan, the intent of this Guide is not to be prescriptive and rigid, but to broadly illustrate the process of solid waste management planning and to offer guidance to the local officials, consultants, provincial government staff and members of the public who are participating in the preparation of an RSWMP. Nevertheless, local governments are strongly encouraged to follow the Guide, since plans prepared in accordance with it should meet all the requirements for expeditious approval by the Province and orderly implementation. A local government which chooses to deviate from the Guide must be prepared to prove that its plan satisfies the intent of the Guide and the letter of the Terms of Reference for RSWMPs and other requirements of the *Waste Management Act* .

The balance of Part 1 provides definitions of certain words and phrases which have specific meaning in the context of the Guide; a more detailed interpretation of legislative requirements and authority; a discussion of planning roles and jurisdiction, and a brief description of available financial assistance programs.

Part 2 details the steps and procedures in the planning process from initiation to adoption and implementation of a solid waste management plan or plan amendment.

Part 3 of the Guide includes recommendations on the scope and detail of planning studies associated with the first two stages of plan preparation, and on the content of the Plan itself,to assure compliance with the *Requirements for Regional Solid Waste Management Plans* .

1.2 DEFINITIONS

For the purpose of this Guide,

"biomedical waste" means

(a) a substance that is prescribed as biomedical waste by the Lieutenant Governor in Council, and

(b) where the Lieutenant Governor in Council prescribes circumstances in which a substance is biomedical waste, a substance that is present in those circumstances;

"composting" means the process of controlled biological decomposition of organic wastes that are separated from the waste stream either at source or in the initial stages of a recovery process;

"household hazardous waste" means a substance and any products used to contain it which is explosive, corrosive, flammable, reactive and/or toxic and which originates from residential, commercial, institutional or industrial sources in quantities which are exempted from the application of the Special Waste Regulation by Section 2(6) thereof;

"official plan" includes official community plans and implementing bylaws adopted pursuant to the Municipal Act, and Comprehensive Development Plans;

"operational plan" means a plan, signed by the Regional Waste Manager, containing requirements prescribed by the Lieutenant Governor in Council for the design, operation and

maintenance of a solid waste site or facility in an area subject to an approved Regional Solid Waste Management Plan;

"person" includes an individual, firm, association, partnership, local government, government agency, public or private corporation, industry or any other entity;

"processing" means the reduction, sorting, separation, recycling or recovery of solid waste;

"recovery" means reclaiming of recyclable components and/or energy from the post-collection solid waste stream by various methods including incineration, pyrolysis, distillation, gasification or biological conversion other than composting;

"reduction" means decreasing the volume, weight or toxicity of material that enters the solid waste stream in the first place, and includes activities which result in greater ease or efficiency of reuse of a product or recycling of materials in the future;

"recycling" means the at-source separation from the solid waste stream of products which are no longer usable in their present form and the use of their material content in the manufacture of new products, and includes composting;

"regional district" means a jurisdiction created under Section 767 of the Municipal Act;

"regional solid waste management plan" means a plan required under S 16.1 of the Waste Management Act that contains provisions or requirements for the reduction, re-use, collection, treatment, handling, storage, recycling, utilization and disposal of solid waste within the whole or a specified part of one or more regional districts;

"Regional Waste Manager" means the Regional Waste Manager in the regional office of the Ministry of Environment responsible for the area of the province in which the Plan area is located;

"residual management" means the disposal, in an environmentally safe manner, of what remains of the solid waste stream "downstream" from reduction, reuse, recycling and recovery activities;

"reuse" means the repeated use of a product in the same form but not necessarily for the same purpose;

"solid waste" or "municipal solid waste" means discarded materials, substances or objects, (also known as refuse) which originate from residential, commercial, institutional and industrial sources, including semi-solid sludges, household hazardous wastes and any other substances which are typically disposed of in municipal-type landfills, but not including special waste or biomedical waste;

"solid waste stream" means the aggregate of all solid waste components, and also the process through which they move from point of generation to ultimate disposal; and

"special waste" means

(a) a substance that is prescribed as special waste by the Lieutenant Governor in Council, and

(b) where the Lieutenant Governor in Council prescribes circumstances in which a substance is special waste, a substance that is present in those circumstances.

1.3 LEGISLATIVE AUTHORITY FOR SOLID WASTE MANAGEMENT PLANNING

1.3.1 Regional Districts

The authority for regional districts to undertake solid waste management planning lies with recent amendments to the *Municipal Act* (Bill 19) and S.16 of the *Waste Management Act* , which in combination enables regional districts to manage solid waste for the whole or a part of the regional district. Furthermore, regional solid waste management planning is required by Section 16.1 of the *Waste Management Act* , as noted previously.

1.3.2 Municipalities

Municipalities are also given authority under the *Municipal Act* to make bylaws for waste removal, but where the *Waste Management Act* imposes an obligation on regional districts to undertake solid waste management planning, S.16 of the *Waste Management Act* simply enables a municipality to do so. However, by virtue of S.20(1) of this Act, a municipal plan must be in compliance with an approved waste management plan of the regional district, and the Minister has authority under S.16(6) of the Act to amend, suspend or revoke an existing or future waste management plan of a municipality if such plan conflicts in any way with an approved regional district plan.

1.3.3 Jurisdictional Objective

Although the wording of the relevant provisions of the *Municipal Act* and *Waste Management Act* may require clarification, the intent of the provisions mentioned in the previous section certainly supports the objective toward which the Ministry of Environment is working with its Municipal Solid & Biomedical Waste Management Strategy: that all solid waste management facilities and programs operate in accordance with an approved regional solid waste management plan. The Ministry prefers a cooperative, mutually-advantageous system in which the regional district would have ultimate control over and be legally and financially responsible for solid waste management programs and facilities. The Plan itself, however, may authorize the operation and/or administration of a site or program by a municipality, other local government entity, company, group or person.

1.4 PLANNING ROLES AND COOPERATION

While the preparation of solid waste management plans in British Columbia is the responsibility of regional districts, the purpose of this section is to outline an approach for a cooperative planning process that recognizes the role of the Ministry of Environment.

As part of the Ministry of Environment's Provincial mandate, the mission of the Environmental Protection Division is to protect the environment of British Columbia by controlling the impact of polluting substances on its air, land and water, and to provide leadership and promote public understanding in the management of society's wastes. Within the Division, the mission of the Municipal Solid and Biomedical Waste Branch is to protect the environment by ensuring that municipal solid and biomedical wastes are managed and disposed of in an environmentally safe manner. The principal legislative authority for carrying out this mandate is the Waste Management Act.

While the Municipal Solid & Biomedical Waste Branch provides overall direction and support for solid waste management planning, Ministry staff at the regional level are responsible for ensuring compliance with plans, permits and other regulations, and for providing assistance to local governments and the public throughout the waste management planning process.

If both local and provincial planning are to be successful, it must be recognized that while both provincial agencies and regional districts have a clear responsibility to plan and have effect in certain areas, each is dependent on the other. Regional districts require provincial policy decisions on financial assistance, market development, freight rates and incentives to support recycling, for instance, while the Province relies on local governments to administer and operate solid waste management programs and facilities that are instrumental in achieving the

provincial goals. Given such interdependence, a cooperative approach to solid waste management planning is essential.

The Ministry of Environment prefers a cooperative solid waste management planning process which

- balances the interests of local governments with the interests of the Province to create and maintain a sustainable solid waste management system;
- recognizes the jurisdictional authority of both Provincial agencies and regional districts in the area of solid waste management;
- recognizes that not only do the plans of each jurisdiction affect plans of the other, but that there are areas where the provincial agencies need regional district cooperation and vice versa;
- provides opportunities for discussion and decision-making leading to development of regional solid waste management plans mutually acceptable to regional districts and provincial agencies, as well as leading to resolution of routine problems.

1.5 FINANCIAL ASSISTANCE PROGRAMS

As part of the Partnership with Local Government element of the Provincial Strategy, financial assistance is available to regional districts, municipalities and community groups, to better enable them to participate in achieving the goal of a 50% reduction in the municipal solid waste stream by the year 2000. The available programs are briefly described as follows:

(a) Solid Waste Management Planning Assistance

This program is available to regional districts, and to municipalities in certain circumstances, and provides an initial, direct contribution to planning costs as well as a cost-share contribution to actual planning costs. This program may be extended to provide assistance for biomedical waste management planning.

(b) Rural Area Waste Management Assistance

This program is available to regional districts, municipalities, improvement districts, community groups and Indian Bands or persons sponsored by one of the foregoing, and provides a cost-share contribution of direct costs, including capital costs, of proposed projects involving

- the collection at a central location and transporting to processing facilities of nuisance products such as auto hulks and white goods, and other materials that may be added as part of implementing the Municipal Solid & Biomedical Waste Strategy;
- closing rural dumps and/or converting them to transfer stations; and
- other local projects that may be included from time to time to advance the achievement of the goals of the provincial solid waste management strategy.

(c) Multi-Material Recycling Assistance

This program is available to regional districts, and in some cases to municipalities, and provides assistance for multi-material, at-source separation programs, including

- initial promotion and education costs;
- collection and processing operating costs;
- cost of transporting recyclables to markets; and
- capital costs of recycling containers and equipment for recycling and composting operations.

The *Applicants' Guide to Financial Assistance Programs* contains greater detail on each of the above programs, plus information on application procedure. Copies of the Applicants' Guide and further information may be obtained by contacting the Regional Waste Manager or the Manager, Marketing & Enterprise Development, in the Municipal Solid & Biomedical Waste Management Branch in Victoria.

In addition to these programs, financial assistance may be available through the federal ENVIRONMENTAL PARTNERS FUND, administered by Environment Canada, Pacific and Yukon Region, #700, 1200 W. 73rd Avenue, Vancouver B.C. V6P 6H9.

PART 2

PROCEDURES FOR DEVELOPING AND ADOPTING REGIONAL SOLID WASTE MANAGEMENT PLANS

2.1. PURPOSE

This part describes the procedural requirements to be met and the steps to be followed by regional districts in preparing and adopting a regional solid waste management plan or undertaking a major amendment to an existing plan.

A major amendment to an RSWMP is any amendment which involves

(a) a change in Plan boundaries;
(b) a review, revision or addition of a major policy area;
(c) the addition or deletion of policies involving other jurisdictions;
(d) the addition or deletion of policies which have a significant effect on the financial implications of the Plan,

or is a major plan amendment in the opinion of the Regional Waste Manager.

2.2 PUBLIC INVOLVEMENT PROCESS

Section 16(2) of the Waste Management Act states that where the Minister of Environment "considers that there has been adequate consultation with the public respecting the preparation of a waste management plan, he may approve the plan...". With the exception of the requirement for a Community Planning Advisory Committee, described in Section **2.5.1**, the actual details of how the public is involved is left to each Regional Board and the Plan area residents, according to the unique blend of population characteristics and information channels in the region. The purpose of this section is to describe basic elements of a public involvement process (PIP) that will not only satisfy the requirements of the Waste Management Act but will promote broad acceptance and a sense of ownership of the PIP by the residents of the Plan area.

A meaningful public involvement process that meets the above two objectives must meet the following criteria:

- Involvement by the general public in the planning process begins as early as possible and continues right through to Plan adoption and beyond to the implementation and monitoring phases.

- The PIP encourages involvement of as wide a range as possible of community interests and stakeholders, both in terms of general review at various stages and the advisory committee structure.

- The PIP is characterized by an open exchange of information between all parties, including advisory committees.

- The PIP encourages public support and commitment to the public involvement program by allowing participation by the public in the design of the program.

- The PIP ensures that public involvement outputs are integrated into the planning process, accorded respect equal to that given to technical advice and openly considered by the Regional Board.

The public involvement process described above is proactive rather than reactive and requires a flexible approach to plan development. Properly and sensitively undertaken, such an approach, in combination with an emphasis on the first 4 R's rather than on landfilling, should reduce or eliminate the display of the NIMBY syndrome.

The flow charts labelled Figures 1, 2 and 3 on pages 13,14 and 15 show the sequence of steps described in the sections which follow.

2.3 DECISION TO PREPARE A REGIONAL SOLID WASTE MANAGEMENT PLAN

The first step in the preparation of a regional solid waste management plan or undertaking a major amendment to an RSWMP occurs when the Regional Board makes its intention formal by passage of a resolution to that effect and instructs staff to prepare a report defining and justifying the plan area. If a Board committee set up to deal with solid waste management issues is not already in existence, now is also the time to strike such a committee and assign to it the role of Steering Committee for the Regional Solid Waste Management Plan.

The Plan area should include the whole of the regional district, and indeed, that is a primary requirement both of Section 16.1 of the *Waste Management Act* and for approval of a request for financial assistance under the program described in Section **1.5 (a)**. However, there may be urgent need for a solid waste management plan for a sub-region of a regional district, or a portion of a regional district, including a member municipality, may be ready to initiate the planning process far in advance of the rest of the district. In such cases, while the regional district or municipality will not be eligible for the Solid Waste Management Planning Financial Assistance Program, the other financial assistance programs mentioned in Section **1.5** are still available, and the Plan may be approved if it is otherwise in accord with the *Requirements for Regional Solid Waste Management Plans* and may be easily integrated into the regional plan when the latter is completed.

It may also be desirable for the Regional Board to join with a neighbouring regional district to take advantage of economies of scale for certain solid waste management facilities or programs. In particular, adjoining regional districts should consider setting up an inter-regional recycling system or at least coordinating their efforts at that level to ensure a common, basic approach where that is advantageous.

2.4 NOTIFICATION OF PROVINCIAL AGENCIES

A copy of the Board Resolution and staff report referred to in Section **2.3** is to be sent to the Regional Waste Manager, with copies and a covering letter also sent to the following:

(a) Ministry of Agriculture and Fisheries - District Agriculturist;
(b) Ministry of Health - Medical Health Officer;
(c) Any municipality or regional district adjacent to the Plan area;
(d) Ministry of Municipal Affairs, Recreation and Culture - Local Government Services Department, Victoria;
(e) Ministry of Parks - Regional Director;

(f) Ministry of Regional and Economic Development - Victoria;
(g) Ministry of Finance and Corporate Relations - Victoria.

The cover letter will ask each of the above agencies whether and how it wishes to be involved in the planning process, including membership on the Technical Solid Waste Advisory Committee described in Section **2.5.2**, and whether it has any concerns or comments on the proposed plan area. The letter will ask each agency to respond directly to the Board within 60 days, with a copy to the Regional Waste Manager. The letter should also request that any special considerations the agency wishes to see addressed by the Plan and any information which the agency thinks may be useful in preparing the Plan be sent to the Board as soon as possible, with a copy to the Regional Waste Manager.

2.5 ESTABLISHMENT OF SOLID WASTE ADVISORY COMMITTEES

The next step in the planning process is the creation of the advisory committee structure, representing the various interest groups, geographic areas and stakeholders in the community, plus the provincial and federal government agencies, particularly those which will play a role in approval of the eventual plan. The Guide envisions the establishment of two committees, one emphasizing community/stakeholder interests and the other, technical interests, both reporting to the Steering Committee. The name and number of advisory committees is not important. In some regional districts, a single committee, with or without sub-committees, may be most suitable. What is important is the creation of an advisory committee structure which satisfies the criteria for the Public Involvement Process identified in Section **2.2**, and allows for efficient and expeditious review and response when that is called for.

In creating these committees, the Board should establish clear mechanisms for referring matters to and receiving reports from the committees, and provide for strong linkages between the two to avoid feelings of isolation and to minimize the potential of one committee submitting a report which in part or whole is unacceptable to the other. The next two sections offer suggestions for the make-up and role of each committee.

2.5.1 Local Solid Waste Advisory Committee (LSWAC)

Creation of this committee is the first step in the public involvement process, and the LSWAC should be composed of a wide range of public and private interest groups. The membership should include technical expertise in the form of the waste management and planning staff of the regional district and member municipalities, and the Regional Waste Manager or his designate. Membership of the LSWAC should also include, but not be limited to representatives from the following:

- local environmental groups and recycling societies;
- electoral areas
- local business, rate-payer and consumer groups;
- School District(s);
- large commercial, institutional and industrial solid waste generators; and
- operators/owners of private solid waste collection, processing and disposal firms or facilities;

Finally, a political link between the LSWAC and the Steering Committee should be provided by one or more directors of the Board serving on the LSWAC.

The LSWAC will provide recommendations and advice to regional district staff and consultants on policy issues, including identification of options to be considered by the planning studies and design of the public involvement program. It will also provide review at various stages and of various elements/outputs of the planning process, including draft terms of reference, reports and the plan itself.

2.5.2 Technical Solid Waste Advisory Committee (TSWAC)

In addition to any agencies listed in Section 2.4 who requested membership, the TSWAC should include representatives from the planning and waste management staff of the regional district and member municipalities, preferably the same individuals who are members of the LSWAC. In addition, to ensure a broad linkage with the LSWAC, at least one non-governmental member of that committee should sit on the TSWAC, and as with the LSWAC, a political link with the Board should be provided by one or more Directors of the Board. Finally, to ensure an appropriate involvement of the Ministry of Environment which must eventually approve the Plan, the TSWAC must include the Regional Waste Manager or his designate(s).

The TSWAC will provide technical evaluation and advice to regional district staff and consultants, including identification of options to be considered, and review of the same elements and outputs of the planning process as the LSWAC.

2.6 ORGANIZATION OF PLANNING STUDIES

The next step in the planning process is to prepare the terms of reference for the planning studies to be undertaken by regional district staff and/or consultants. Part 3 of this Guide provides direction on the level of detail and analysis to be included in these planning studies. The Regional Board may choose to prepare one set of terms of reference and select one consultant to undertake the various planning studies and preparation of the plan itself, or it may wish to call for proposals for each stage of the process. It may also have the staff resources to undertake part or all of a planning study itself. In either of the first two cases, and with appropriate modification for the latter case, the procedure is as follows:

1. Draft Terms of Reference are prepared by regional district staff;
2. Draft ToR are reviewed by LSWAC and TSWAC;
3. Final ToR are prepared by regional district staff and approved by the Regional Board;
4. A Call for Proposals is issued by the Regional Board;
5. Proposals are evaluated by LSWAC and TSWAC; and
6. A consultant is selected by the Regional Board.

2.7 APPLICATION FOR FINANCIAL ASSISTANCE

Whether regional district staff will prepare the plan or the regional district selects a consultant to do the work, once a detailed work plan for the planning studies is available, the regional district should make an application to the Regional Waste Manager for financial assistance under the Solid Waste Management Planning Assistance Program.

2.8 STAGE 1: SOLID WASTE MANAGEMENT SYSTEM / OPTIONS

Stage 1 analysis involves the description of the existing solid waste management system, including the organizing and evaluating of available information and the identification of information gaps to be addressed at Stage 2. It also involves identification of various solid waste

management options and recommending those which should be subjected to detailed evaluation in Stage 2. Part 3 of this Guide provides direction on the type and level of analysis required and the identification and evaluation of options.

Stage 1 begins with a Regional Board resolution authorizing staff and/or a consultant to conduct the necessary planning study or studies. The subsequent process is similar to that in Section **2.6** with the addition of public review, as follows:

- Stage 1 study is conducted and a draft Report is prepared;
- The draft report is reviewed by TSWAC and LSWAC;
- The final draft Report is prepared, incorporating the results of the SWAC review process, and presented to the Board;
- The Regional Board authorizes review of the final draft by the public;
- The final Stage 1 Report is prepared, incorporating the results of the public review process, and presented to the Regional Board;
- The Regional Board accepts the Stage 1 Report and submits it to the Regional Waste Manager for Ministry review and approval;
- Following Ministry approval, the Stage 1 Report is amended, if required, and approved by Board resolution.

2.9 STAGE 2: EVALUATION OF OPTIONS

Stage 2 is entered, upon completion of Stage 1, by a resolution of the Regional Board which directs its staff and/or consultant to prepare detailed evaluations of the solid waste management options recommended in Stage 1. If a new consultant is involved, or if major amendments are necessary to the terms of reference established earlier in the process (see Section **2.6**), the resolution will direct the preparation of new draft terms of reference, followed by the same procedure described in Section **2.6**.

The procedure for conducting the Stage 2 study and ending with approval of the Stage 2 Report is exactly the same as for Stage 1, with the final step being a resolution to proceed to Stage 3.

The Stage 2 Report will recommend a set of options and strategies which are in keeping with the *Requirements for Regional Solid Waste Management Plans* , and identify the environmental, social and economic impacts of that set of options.

2.10 STAGE 3: PLAN PREPARATION AND ADOPTION

2.10.1 Plan Preparation

The resolution initiating Stage 3 will direct staff and/or consultant to put the Plan into a content form which complies with the *Requirements for Regional Solid Waste Management Plans* , including the provisions for implementing the various parts of the plan and monitoring its effectiveness, particularly the achievement of its stated reduction goals. As for the administrative form of the Plan, Regional Boards are encouraged to put the RSWMP into bylaw form and give it the same treatment and status accorded to one of its major land use plans. On the basis of subsequent experience with the enforceability of RSWMPs, the Ministry of Environment, in consultation with the Ministry of Municipal Affairs, Recreation and Culture, may require the adoption of RSWMPs as bylaws. The balance of this section and Figure 3 on page 15 reflect this preferred option.

Once prepared, the draft Plan will be reviewed by the SWACs, and the final draft, incorporating any changes, prepared as a bylaw. The Regional Board will then give 1st and 2nd Readings to the Plan bylaw and authorize the necessary public hearing(s). After incorporating any changes resulting from this phase of the public review process, the Board will give 3rd Reading to the Plan bylaw and submit it to the Regional Waste Manager. He will forward the Plan Bylaw, together with his final review and recommendation, to the Minister of Environment and Minister of Municipal Affairs, Recreation and Culture for review and final approval by the Province.

2.10.2 Ministerial Approval

If the Ministers are satisfied that the Plan is in accord with the *Requirements for Regional Solid Waste Management Plans* and that the public was given adequate opportunity to examine and comment upon the proposed plan, they will give their approval, subject to any conditions.

The approval letter will also direct the Regional District to prepare operational plans for specified solid waste sites or facilities in consultation with and satisfactory to the Regional Waste Manager. It may also require submission of loan authorization bylaws or other financial implementation measures satisfactory to the Ministry of Municipal Affairs, Recreation and Culture.

2.10.3 Plan Adoption

Following receipt of the Ministerial approval, the Board will give Final Reading and Adoption to the Plan Bylaw, including any changes required by the Minister(s). Sufficient copies should then be sent to the Ministry of Environment for distribution to relevant provincial agencies.

2.11 IMPLEMENTATION

Following adoption of the Plan, the Regional District and its member municipalities will proceed with the implementation measures contained in the Plan. The first steps will be the preparation of the Operational Plans and other measures specified in the Ministerial approval.

The preparation of Operational Plans should include review by the SWACs and general public. In fact, it is strongly recommended that some form of advisory committee be kept in place to provide on-going technical advice and public input to the Board and staff in the implementation and monitoring phases of the Plan. A flexible approach to solid waste management will be necessary to respond to the many decisions still likely to be required, given the likelihood of changing waste management technology, waste stream composition and public attitudes.

2.12 APPROVAL OF IMPLEMENTATION MEASURES

When the operational plans and any financial implementation measures required by the respective Ministries are completed, the Regional District will submit them to the Regional Waste Manager and Ministry of Municipal Affairs, Recreation and Culture, respectively, for approval. If the Regional Waste Manager is satisfied with the operational plans, he will direct the adoption of the approved operational plans as Schedules to the RSWMP Bylaw and cancel any existing permits for sites subject to the operational plans.

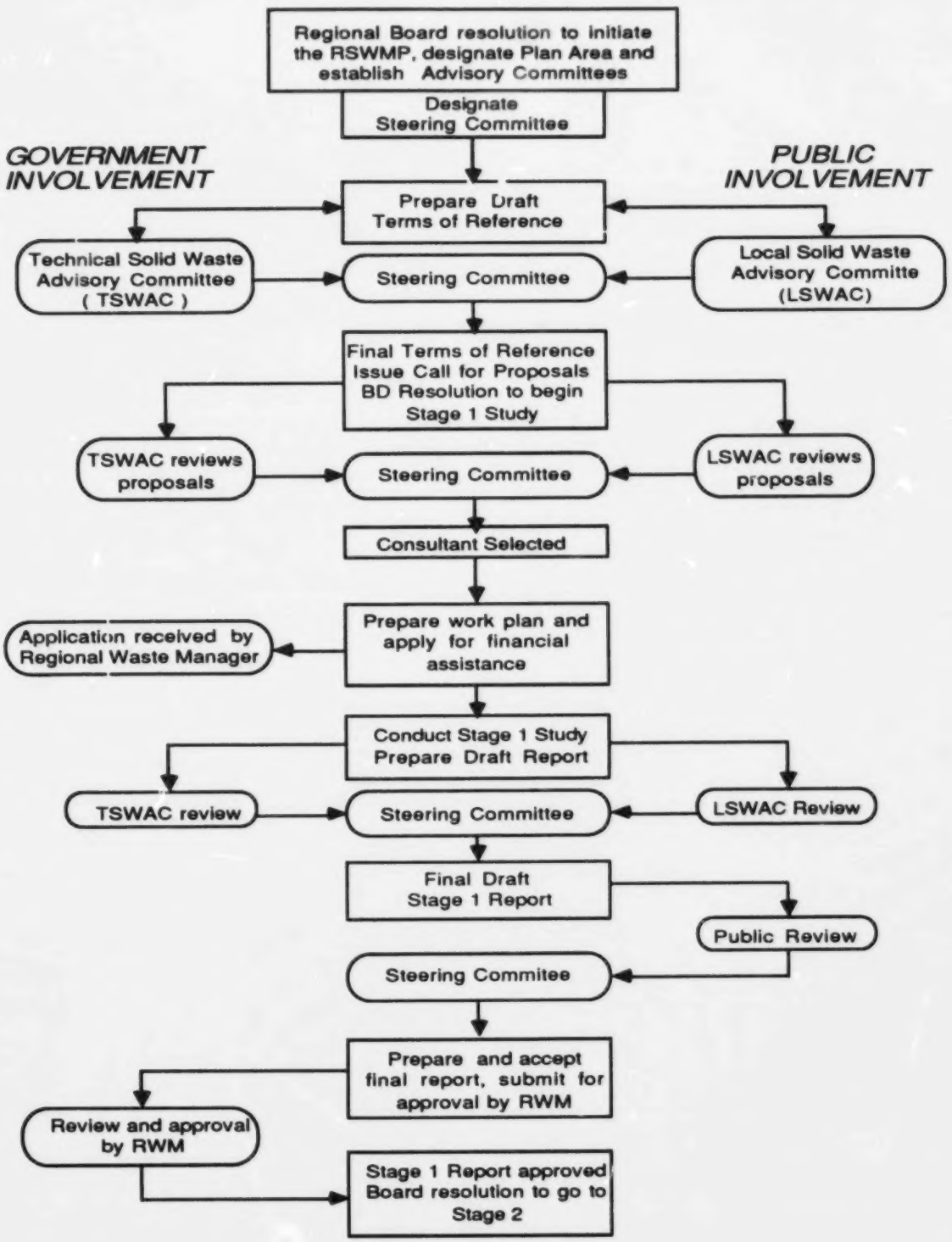
Regional Board resolution to initiate the RSWMP, designate Plan Area and establish Advisory Committees
Designate Steering Committee
GOVERNMENT INVOLVEMENT
PUBLIC INVOLVEMENT
Prepare Draft Terms of Reference
Technical Solid Waste Advisory Committee (TSWAC)
Steering Committee
Local Solid Waste Advisory Committe (LSWAC)
Final Terms of Reference Issue Call for Proposals BD Resolution to begin Stage 1 Study
TSWAC reviews proposals
Steering Committee
LSWAC reviews proposals
Consultant Selected
Application received by Regional Waste Manager
Prepare work plan and apply for financial assistance
Conduct Stage 1 Study Prepare Draft Report
TSWAC review
Steering Committee
LSWAC Review
Final Draft Stage 1 Report
Public Review
Steering Commitee
Prepare and accept final report, submit for approval by RWM
Review and approval by RWM
Stage 1 Report approved Board resolution to go to Stage 2

Figure 1
STAGE 1: WASTE MANAGEMENT SYSTEM / OPTIONS

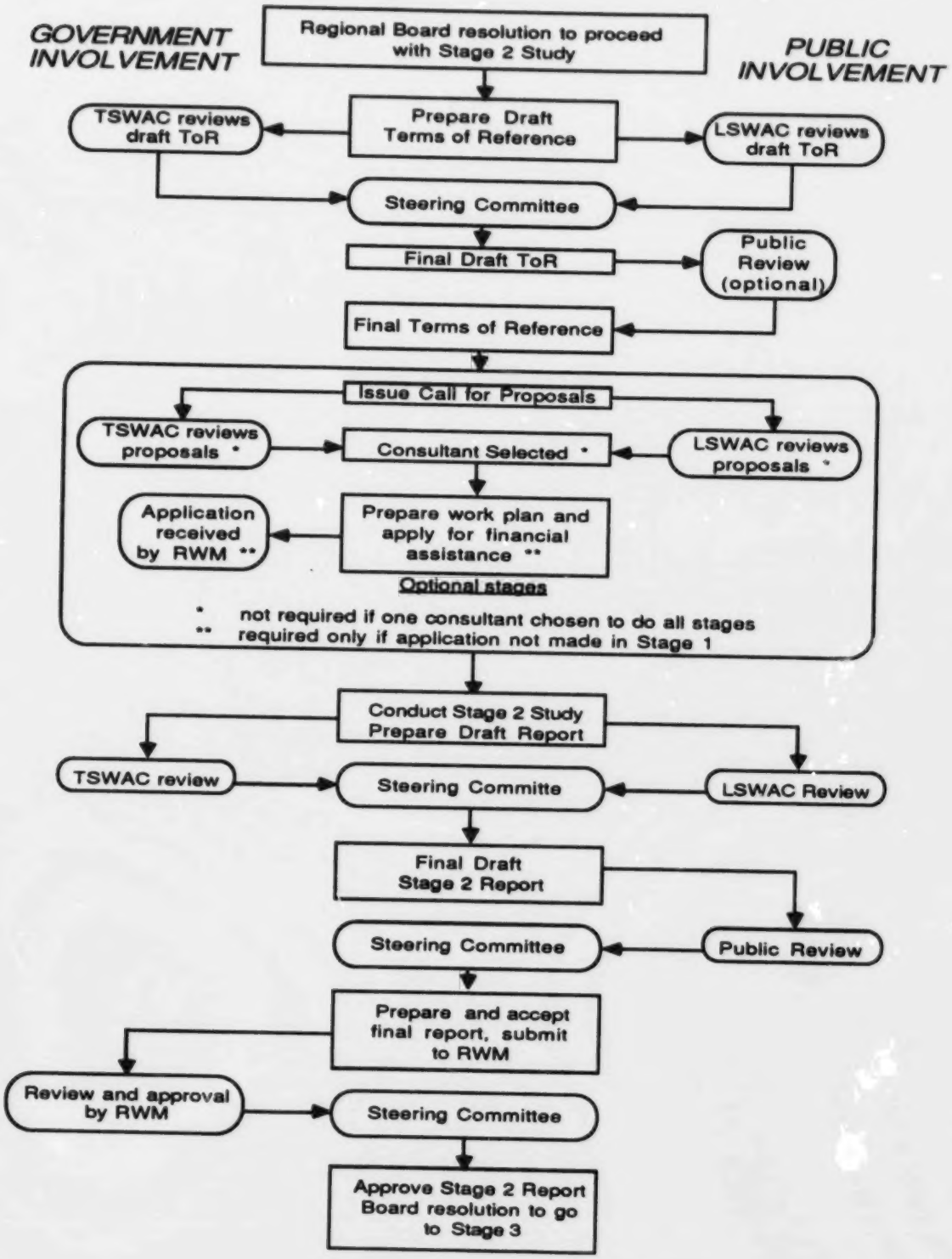
GOVERNMENT INVOLVEMENT
PUBLIC INVOLVEMENT
Regional Board resolution to proceed with Stage 2 Study
Prepare Draft Terms of Reference
TSWAC reviews draft ToR
LSWAC reviews draft ToR
Steering Committee
Final Draft ToR
Public Review (optional)
Final Terms of Reference
Issue Call for Proposals
TSWAC reviews proposals *
Consultant Selected *
LSWAC reviews proposals *
Application received by RWM **
Prepare work plan and apply for financial assistance **
Optional stages
* not required if one consultant chosen to do all stages
** required only if application not made in Stage 1
Conduct Stage 2 Study Prepare Draft Report
TSWAC review
Steering Committe
LSWAC Review
Final Draft Stage 2 Report
Steering Committee
Public Review
Prepare and accept final report, submit to RWM
Review and approval by RWM
Steering Committee
Approve Stage 2 Report Board resolution to go to Stage 3

Figure 2
STAGE 2: EVALUATION OF OPTIONS

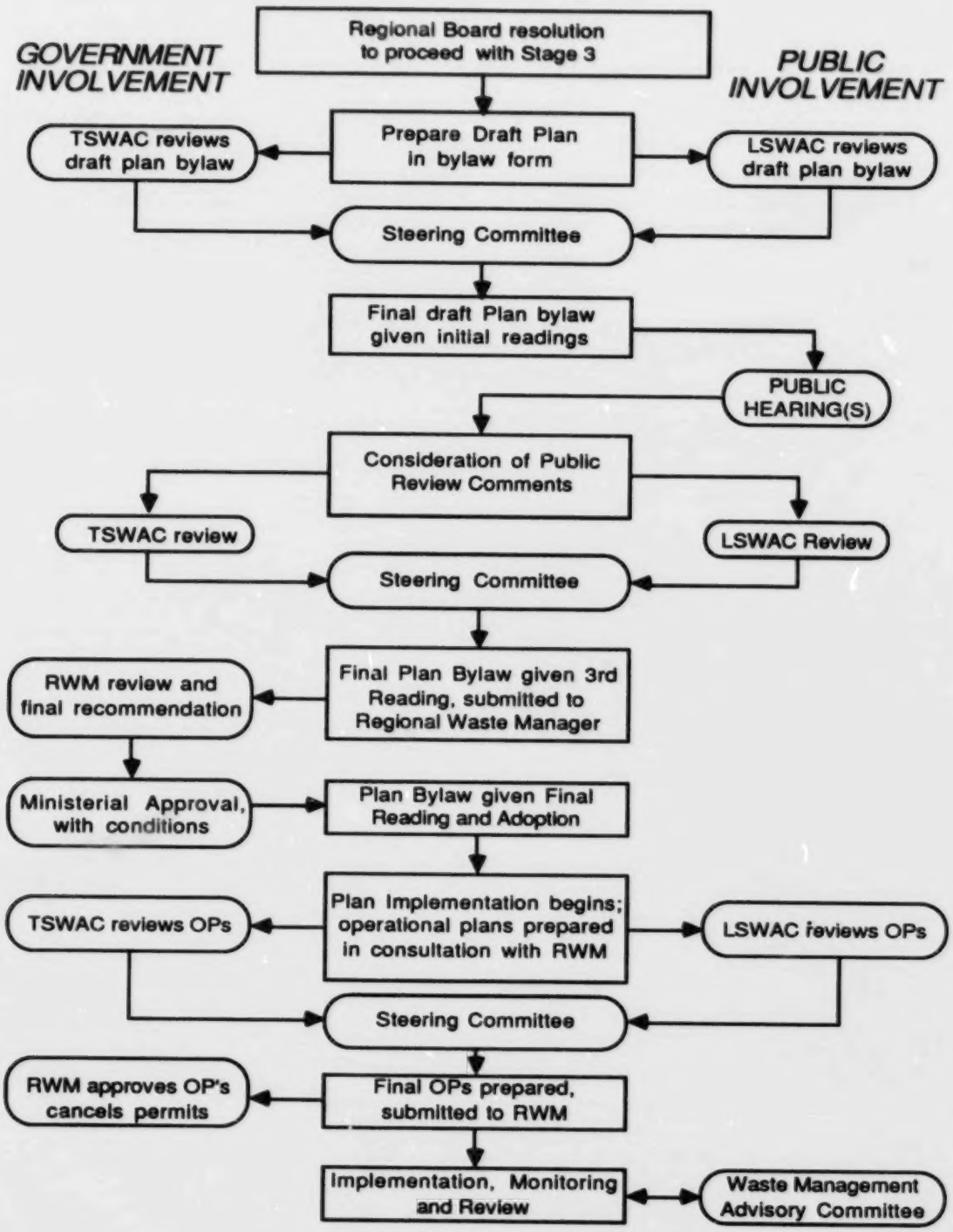
GOVERNMENT INVOLVEMENT
PUBLIC INVOLVEMENT
Regional Board resolution to proceed with Stage 3
Prepare Draft Plan in bylaw form
TSWAC reviews draft plan bylaw
LSWAC reviews draft plan bylaw
Steering Committee
Final draft Plan bylaw given initial readings
PUBLIC HEARING(S)
Consideration of Public Review Comments
TSWAC review
LSWAC Review
Steering Committee
Final Plan Bylaw given 3rd Reading, submitted to Regional Waste Manager
RWM review and final recommendation
Ministerial Approval, with conditions
Plan Bylaw given Final Reading and Adoption
Plan Implementation begins; operational plans prepared in consultation with RWM
TSWAC reviews OPs
LSWAC reviews OPs
Steering Committee
RWM approves OP's cancels permits
Final OPs prepared, submitted to RWM
Implementation, Monitoring and Review
Waste Management Advisory Committee

Figure 3
STAGE 3: PLAN PREPARATION AND ADOPTION

PART 3

CONTENT GUIDELINES FOR REGIONAL SOLID WASTE MANAGEMENT PLANS

3. PURPOSE

The purpose of this part of the Guide is to provide guidelines for designing and undertaking the Stage 1 and Stage 2 planning studies and for the Stage 3 process of putting the Plan into a form which will comply with the *Requirements for Regional Solid Waste Management Plans* .

STAGE 1 WASTE MANAGEMENT SYSTEM / OPTIONS

The recommendations, suggestions and comments in the following sections are intended to provide direction to regional districts in the objectives and content of the planning study for this first stage in the preparation of the actual plan document, the description of the existing solid waste management system and identification of major options to be evaluated in detail in Stage 2.

4. PLAN AREA

4.1 GEOGRAPHIC AREA/LOCATION/PARTICIPANTS

This section should include a map or maps at a scale appropriate for showing the area to be covered by the RSWMP; the location, name and level of organization of the various municipalities, electoral areas and communities involved in the plan; and the location and contributing area of the existing solid waste handling and disposal facilities. As noted in Section 2.2, the Plan area may include the entire regional district, one or more of its sub-regions and/or a portion or all of an adjacent regional district. Where one of the latter two situations is the case, the justification for proceeding on that basis should be explained, and the need to submit a plan for the whole of the regional district by 1995 acknowledged.

4.2 OFFICIAL PLAN DESIGNATIONS

Since the pattern and timing of settlement and other land uses will have a significant effect on solid waste management, this section should include the relevant goals, objectives and policies from the following:

(a) Official Community Plans for municipalities and areas of the regional district;
(b) Existing Official Settlement Plans;
(c) Rural Land Use Bylaws;
(d) Implementing Bylaws; and
(d) Comprehensive Development Plans.

4.3 POPULATION

This section should include the existing population of the Plan area, both overall and for sub-area or community components relevant to the Plan; population projections for the Plan area for at least the time horizon of the Plan, and any demographic data which is relevant to solid waste management planning.

4.4 ECONOMIC BASE

This section should contain a description of the economic base of the Plan area, both existing and projected, with particular reference to the existing and projected solid waste generation capacity of specific economic entities and activities. Relevant objectives and policies from existing Economic Development Plans should also be included.

4.5 PHYSICAL DESCRIPTION/CONSTRAINTS

This section should contain a general description of the climate, major landforms, terrain, soils, surface watercourses, groundwater levels, airsheds, vegetation and wildlife, with particular reference to those factors which pose constraints to the siting, economics or operation of solid waste management facilities or programs.

5. EXISTING SOLID WASTE MANAGEMENT SYSTEM

5.1 CHARACTERISTICS OF SOLID WASTE STREAM

A detailed knowledge of the make-up of the regional solid waste stream is fundamental to the 5R management strategy, at both the regional and provincial levels. This section should therefore contain an analysis of the composition of the solid waste stream, by weight and volume of various components, and including recyclables/compostables (actual and potential) and residuals available to recovery facilities or requiring disposal, for the following sources of solid waste:

(a) residential, both urban and rural, including household hazardous waste;
(b) commercial/institutional, including biomedical waste; and
(c) industrial/agricultural, including special waste.

(Biomedical and special wastes are to be included in this part of the analysis only, for the sake of the comprehensiveness of the waste stream composition study. Management of these wastes, however, is properly the subject of special, parallel planning processes.)

Projected solid waste generation, based on economic and population projections, and existing generation trends, should also be included.

Composition data specific to the plan area should be used or produced whenever possible and practical. Where typical breakdowns based on experience in other jurisdictions are utilized, allowance should be made for non-typical solid waste volumes or types specific to the region. However, since periodic analyses of this kind will be a valuable tool for monitoring the effect of the Plan and assessing the need for new recycling or recovery facilities, it is strongly recommended that the regional district provide for generating this data itself. The Ministry anticipates that additional direction and assistance on this issue will become available to

regional districts as a result of a provincial call for proposals for analyzing the composition of the solid waste stream.

Another class of solid waste that should be analyzed and quantified is "hard to dispose of" or "nuisance" solid waste, and includes, but is not limited to the following:

- semi-solid waste, including sewage sludge and septage;
- oily waste;
- demolition and land clearing debris;
- other wood waste;
- tires, batteries, vehicle hulks;
- disposable diapers and other incontinent care products;
- gypsum products;
- consumer electronics;
- pesticide and herbicide containers;
- animal carcasses, food processing and agricultural wastes; and
- "white" goods, furniture and other bulky items.

The actual disposal methods and costs should also be detailed for this class of solid waste, not only to assist in determining the true cost of solid waste disposal in the region, but also to provide the Ministry with information upon which it can base provincial initiatives that will benefit the whole or large portions of the province.

5.2 COLLECTION SYSTEM

This section should contain descriptions and analyses of the various pathways along which solid waste is transported from its point of generation to its end use or ultimate disposal, and the collection methods for each, according but not limited to the following:

- type and number of pathways available, including nodes such as transfer stations;
- the amount and type of solid waste flowing along each pathway;
- the persons responsible for funding, operating and maintaining the collection systems for each pathway;
- the geographic area and population served by communal systems;
- the potential for and constraints to expansion of communal systems.
- problems with and impacts of various collection methods and pathways; and
- the total collection system costs, in aggregate and for each pathway.

5.3 POST-COLLECTION SYSTEM

5.3.1 Operations Description

This section should contain information about the various methods of processing and disposing of solid waste after collection, including the following:

(a) Recycling, including individual and communal composting;
(b) Recovery;
(c) Thermal reduction, including incinerators and open burning; and
(d) Landfilling

Each method should be described and analyzed in terms of, but not limited to the following elements, as applicable:

- site/facility locations, classification and number of people served;
- operational requirements;
- types and quantities of solid waste accepted and banned;
- persons responsible for each aspect of the operation;
- land, equipment and labour involved;
- operational problems;
- markets and quantities of recyclables shipped;
- disposal of residue;
- public involvement/support;
- promotional/educational programs;
- estimated life span of sites and facilities, in absence of the RSWMP;
- environmental, social and economic impacts;
- opportunities for and constraints to handling greater quantities or additional types of solid waste; and
- involvement/cooperation with industry or adjacent jurisdictions, including inter-jurisdictional solid waste transfers, joint facilities and waste exchanges.

5.3.2 Administrative and Financial Structure

In terms of the administrative structure, this section should describe any existing or proposed solid waste management bylaws and regulations. Specified area bylaws should be described in terms of population served, location and functions. Also included should be a listing and brief description of all existing Waste Management Permits.

In terms of financial structure, this section should include total solid waste management system costs, including projected closure and post-closure costs for landfill sites and other facilities. The funding of each system element should be described, including revenues and cost recovery mechanisms as well as money raised through general taxation, specified areas and government grants or loans. Finally, the economic viability of facilities or operations and future financial requirements should be assessed.

5.4 REGIONAL SOLID WASTE MANAGEMENT ISSUES

The description of the existing solid waste management system should conclude with a summary of regional and local issues that need to be addressed in the RSWMP, and an identification of issues which may or will require the involvement of adjacent jurisdictions or other levels of government for resolution.

6. SOLID WASTE MANAGEMENT OPTIONS

6.1 DESCRIPTION OF OPTIONS

This section should contain a brief description of the various major options available or practical at the regional level for managing the components of the solid waste stream using one or several of the 5R's. The range of options should reflect all the stages that a material or product passes through from actual use to final disposal. For reduction, reuse and to some extent, recycling, detailed identification of options may be deferred to Stage 2 where it may be

accomplished in conjunction with detailed evaluation. For recovery, perhaps the only options to be identified at this stage are whether or not to evaluate recovery programs, and, if so, the suitable technologies and timing.

Regarding residual disposal, the study should identify a number of potential landfill and/or incineration sites, based on selection criteria such as the following:

- general soil conditions and topography;
- climatological conditions;
- environmental impacts, including effects on water, soil and airshed quality for both the site and the transportation of solid waste to the site;
- social impacts, including effects of site aesthetics and on adjacent land uses
- economic impacts, including available land area and value, transportation and transfer costs, capital and operating costs and life/capacity;
- impact on/of recycling and resource recovery, and
- ultimate use

6.3 OPTIONS RECOMMENDED FOR STAGE 2 EVALUATION

Once the various options have been identified, they should be given a preliminary appraisal to determine which ones should be recommended for detailed evaluation in Stage 2 and to identify information gaps that must be addressed by the Stage 2 planning studies. The appraisal of options should be based on criteria which relate to the goals and objectives for the Plan, including environmental protection, compatibility with provincial waste management policies and with existing legislation and regulations, public acceptability, technical feasibility, risk of failure, and cost impacts, including environmental savings and avoidance of disposal costs.

STAGE 2 EVALUATION OF OPTIONS

The recommendations, suggestions and comments in this part of the Guide are intended to provide direction to regional boards in the design and carrying out of the planning studies for this second stage in the preparation of the plan document, the detailed evaluating of solid waste management options , assessing the impacts of the preferred options, and recommending which options should be included in the Plan.

7. DETAILED EVALUATION OF OPTIONS

7.1 PROMOTIONAL AND EDUCATIONAL PROGRAMS

The main issue regarding promotional and educational programs is whether or not to supplement existing or proposed provincial or federal programs with programs designed specifically for the Plan area. The greatest relevance of such programs will be in the areas of reduction, reuse and recycling. The study should consider the appropriate target groups for promotional and educational campaigns, and their coordination and phasing in order to complement management strategies.

7.2 REDUCTION AND REUSE

The study should determine if there are means available at the regional district or municipal level to reduce the amount of solid waste created and encourage the reuse of materials or products. The reduction and reuse programs listed below should be used as possible options, although the list is not intended to be exhaustive. For some of these programs, especially public awareness education and school curricula, the Ministry has or may soon have resources and material available which would be useful to local governments implementing these programs.

Reduction and Reuse Programs:

- public awareness education, such as encouraging consumers to utilize second-hand, rental and repair businesses, and to increase bulk buying;
- controlling the flow into the Plan area of non-refillable and non-recyclable containers and of products with excessive packaging, an area where cooperation and coordination among adjacent jurisdictions can have even greater effect;
- procurement standards for durability, recyclability, reusability and recycled material content;
- volume- or weight-based garbage collection rates;
- increased tipping fees at disposal sites;
- school curricula;
- commercial, retail and industrial education, and/or technical/financial assistance;
- local government setting of examples through in-house programs such as employee education; increased use of electronic mail, double-sided copying and printing; decreased use of non-recyclable paper, such as NCR forms and fax paper; use of cloth towels or electric hand dryers in rest rooms; and using only reusable and recyclable containers and packaging in food operations;
- awards and other forms of public recognition; and
- banning the acceptance at disposal sites of certain materials for which there are appropriate alternatives.

While the above programs can have significant effects, another effective way to promote reduction and reuse is to encourage provincial and federal programs. The Plan can influence policies at these levels, and the study should consider which recommendations, based on the solid waste stream characteristics of the Plan area, should be made to senior governments.
The study should evaluate local waste reduction options and recommend the suitability of each option for the local community and its priority. Viable waste reduction programs should be explored and recommended, including specific reduction goals or targets, means of monitoring the achievement of those goals and targets, and an education component aimed at all generators of solid waste.

7.3 RECYCLING

7.3.1 Solid Waste Stream Targets

Based on detailed knowledge of the regional solid waste stream, the study should determine which sources, types or classes of solid waste could be targeted for recycling programs. For example, a source could be commercial, a class could be paper, and type could include ledger, newsprint or corrugated cardboard. Each of these targets may require a different approach or management strategy, including how soon management efforts should be directed at a particular target. A further explanation of waste targets is included in Section 9.

The list of targets for each Plan should be based on the following lists of recyclables, potentially recyclables, and materials which may be recycled:

(a) a *recyclable material* is one for which the processing technology exists to create a product which has a stable market or which has a beneficial end use, and for which there are no major impediments to getting the material to processing and market locations. (Transportation cost is not considered a major impediment unless it there is insufficient storage capacity to accumulate materials until unit transportation costs are affordable). The list for British Columbia for 1990 is as follows:

- old newsprint (ONP);
- old corrugated cardboard (OCC);
- high grade paper;
- clean plastic, sorted by resin type
- metals
- container glass
- aluminum cans
- tin cans

(b) a *potentially recyclable* material is one for which processing technology and markets or beneficial end uses do exist, but for which major impediments to recycling also exist, such as cost or difficulty of separation and/or collection; extremely high transportation costs; limited access, physical or financial, to the technology; and very unstable and/or limited markets. The list for British Columbia in 1990 is as follows:

- mixed waste paper
- mixed, contaminated plastic
- "white" goods
- auto hulks
- organic/compostable wastes
- tires
- batteries
- used oil
- gypsum

(c) a *material which may be recycled* is one for which processing technology and/or markets need considerable development, and which may face as well some or all of the major impediments described above. The list for British Columbia in 1990 is as follows:

- demolition waste
- household hazardous waste
- asphalt
- land clearing debris
- disposable diapers

The regional target list should be based on the following variables:

(a) potential for significant waste stream diversion;
(b) ease of separation from waste stream and collection;
(c) provincial and local recycling goals;
(d) local, provincial and extra-provincial market conditions;
(e) transportation costs and means of reducing transportation costs, such as subsidies, storage/accumulating of marketable quantities, intermediate processing, and cooperation with adjacent jurisdictions; and
(f) existing or proposed provincial strategies and initiatives.

As well as recommending a list of targets, the study should examine processes and recommend a process for modifying the list between scheduled plan revisions. If no provisions are specified in the Plan for changing the list, any changes must be accomplished through Plan amendment.

A major class of solid waste which should be given considerable attention is organic/compostable material, including kitchen scraps, yard and most land clearing debris, some paper, food processing residues and septage and sewage sludges. This class alone accounts for 30 - 35 % by weight of the solid waste stream and its diversion would simplify management of the remainder, especially regarding its attractiveness to wildlife and impact on soil and groundwater quality. Options should include encouragement of home composting; source collection and communal composting, including co-composting of septage and sewage sludges; and the use of enclosed/forced systems, such as digesters, for northern/colder climates or year round operations anywhere.

7.3.2 Responsibility

The options to be considered here are related to the responsibility for various parts of the strategy. For instance, should the recycling operation be managed and operated by the local government, by a private firm or by a community-based, non-profit society, or by some combination of those? The answer may be different for different geographic areas or for urban and rural areas.

7.3.3 Collection Systems

The study should develop and evaluate options for collection of recyclables along each of the pathways analyzed in Stage 1, according to the sources of recyclables and their destination at processing or transhipment centres.

The major options will be curbside collection versus drop off bins and/or depots, according to targeted recyclables and varying population densities within the Plan area. Multi-material, curbside collection has been demonstrated to be very effective in achieving high participation and recovery rates, and in promoting environmentally sound life-style and attitude changes, largely through convenience to householders and businesses. Drop-off centres of some kind are suitable for rural or low density areas, but should also be considered in conjunction with curbside programs, for low density materials such as some plastics and OCC; bulky objects, such as furniture or appliances; and reusable materials.

A successful curbside collection program will involve one or more of the following elements:

- containers provided to residents;
- weekly collection;
- collection same day as garbage;
- education and promotion;
- rate incentives and disincentives; or
- mandatory separation and collection.

Other levels of options include collection equipment - the various vehicles available, their labour requirements and their suitability for the proposed curbside area, and containers provided, i.e., blue box or blue bag; solid waste source, whether residential, institutional or commercial; and type of recyclable to be collected.

For instance, with respect to compostable solid waste, an emphasis on home composting of kitchen and yard waste will require different collection strategies than directing such solid waste to a neighbourhood or central facility, although this is an example where a combination of options may be most appropriate.

Where an alternative to curbside, multi-material collection is being considered for an area suitable for curbside collection, both the alternative and curbside collection should be evaluated according to the following criteria:

- anticipated recovery rates and participation levels;
- impact on available or anticipated residual management capacity;
- cost impacts on rate-payers, in relation to waste system costs in general and residual management costs in particular;
- utilization of environmentally sound reduction or recovery technologies;
- accessibility/convenience to residents of the Plan area; and
- other relevant factors.

Two other areas deserve considerable attention, multi-family housing and rural areas, in order to provide the opportunity to recycle to as many Plan area residents as possible.

Multi-family housing collection programs should include one or more of the following options:

- drop-off stations within the building/complex;
- drop-off depot or bins near the building/complex;
- door-to-door service within building/complex, especially for those in which elderly or disabled residents live;
- curbside collection for complexes with less than 20 units or with units which have individual garbage cans;
- mobile recycling centres in addition to stationary centres; and
- requiring provision for collection of recyclables in the design of new multi-family buildings or complexes.

Rural or low density collection programs should include one or more of the following options:

- combined collection of garbage and recyclables where garbage collection is carried out;
- collection from individual households or groups or households, particularly if second-hand or existing equipment is used;
- collection of recyclables by neighbourhood volunteer or community service group;
- drop-off bins or depots, at convenient locations such as shopping, service and recreational centres, churches, other meeting places, and all solid waste facilities, such as transfer stations; and
- mobile recycling centres in addition to stationary ones.

7.3.4 Processing and Shipping Systems

The study should explore options related to the level of processing to be done for each solid waste target, including equipment, land and labour requirements, and location of processing facilities within the region. Utilization of facilities in another region should also be evaluated. Finally, the various means and routes of shipping the recyclables to intermediate or end destinations should be reviewed, recognizing that processing and marketing strategies may pre-determine or limit shipping options.

7.3.5 Marketing System

The study should identify and document all markets for recyclables, including possible markets for recyclables not handled by existing recyclers; the strengths and weaknesses of those

markets; the general demand for recyclables; and general market conditions and their probable future. The study should recommend the most suitable market for each recyclable, including back-up markets if possible, and pay particular attention to the development of local markets. This will be important for products like compost which will be generated by most communities sooner or later.

7.3.6 Involvement with Industry, Adjacent Jurisdictions and Other Levels of Government

Options to be considered here may include the sending of recyclables to or accepting them from adjacent jurisdictions because of geographical factors or the need to achieve economies of scale. Involvement with industry may include setting up a regional industrial solid waste exchange or participating only in the provincial exchange, or taking advantage of industrial shipping routes for the transport of recyclables. With regard to other levels of government, the study should examine options available to those governments to facilitate recycling in the region.

7.3.7 Financial Evaluation

At this point, the study should estimate the total cost for each of the various options described earlier, in order to provide the basis for the evaluation of options for funding and cost recovery mechanisms.

The study should examine the options for funding the various components of the recycling system and estimate the amount of income that could be generated from increased landfill tipping fees and cost recovery mechanisms such as sale of recyclables.

In addition to assessing the raising of money through general taxation measures, the study should also explore grants and cost-sharing programs available through the provincial and federal governments.

7.3.8 Phasing Schedule

The study should examine the most appropriate dates and sequences for introduction of parts of the recycling strategy, including expansion of collection systems or of processing systems to recycle additional solid waste types. The study should also identify any pre-conditions or precursors that would influence the start of any new phase and any factors that would affect the impact of the phasing schedule.

7.3.9 Impacts

The evaluation of options for solid waste recycling should conclude with a determination of the environmental, social and economic impacts of the various options, including intangible as well as tangible benefits and costs.

7.4 RECOVERY

7.4.1 Justification

Recovery is an optional element in the process; however, in the more densely populated areas of the province such as the GVRD, waste processing and recovery plants should be considered. The study should therefore analyze the feasibility and suitability of recovery facilities in the

region, in comparison with management strategies for the specific solid waste type(s) located at a higher level of the hierarchy, and with regard to the impacts of the recovery facility and those higher level strategies on each other.

7.4.2 Targets, Technology, Location and Markets

If justifiable, the study should look at which components of the solid waste stream may be accessible by a recovery facility; which technologies are available and suitable for the region; possible locations for siting one or more recovery facilities; and potential markets for recovery facility products. Possible technologies include material recovery systems producing recyclables, compost and/or Refuse Derived Fuel (RDF); pyrolysis; and incineration, except for simple destruction systems which are only recommended in special circumstances. Typically, markets for certain outputs of recovery facilities, such as steam, must be located fairly close to the facility, while markets for recyclables recovered may be the same, depending on the quality, as markets already identified for similar material generated by recycling programs.

Financial assistance for the construction of two high technology resource recovery demonstration facilities in British Columbia was provided by the Province in order that the evaluation of those projects would be of benefit to other jurisdictions with a similar solid waste management situation.

7.4.3 Responsibility

As was done for recycling operations, the study should evaluate the options for which person is responsible for administration, financing and operation of recovery facilities, including joint ownership.

7.4.4 Involvement with Industry, Adjacent Jurisdictions and Other Levels of Government

This is an area where cooperation with another solid waste management agency can be beneficial, by way of sharing the high financial cost, taking advantage of economies of scale, and/or responding to geographic proximity factors. Taking advantage of an existing industrial facility or participating in a project with the provincial or federal governments may also be possible. The study should therefore carefully examine all possibilities, keeping in mind the rapidly changing technology in this field and more importantly, in the recycling field.

7.4.5 Financial Evaluation

As with recycling, the study should estimate the total cost of recovery facilities over their anticipated lifespan. Funding methods should then be examined, along with cost recovery mechanisms such as sale of products or energy and tipping fees.

7.4.6 Phasing Schedule

The study should examine the possibilities for flexibility in the installation of recovery capacity, through modular design, for example, in order to respond to changing technology or solid waste volume and character.

7.4.7 Impacts

The environmental, social and economic impacts of recovery options should be examined. In particular, the mutual interaction over time with curb-side source separation recycling programs should be assessed, including intangible as well as tangible effects.

7.5 RESIDUAL MANAGEMENT

7.5.1 Site Evaluation

The study should estimate the number, size and location of landfill and/or incineration sites required, based on Stage 1 analysis of the life expectancy and integrity of existing sites and on the type and amount of residual solid waste that may require disposal under the various options already evaluated. Sites which could fulfil these needs should be selected from the list of potential sites, identified and given preliminary evaluation in Stage 1, and evaluated in detail, including but not limited to the following:

- land acquisition costs;
- surface water hydrology;
- geologic and hydrogeologic conditions;
- quality of local and regional airsheds
- suitability for disposal of special or nuisance solid waste;
- life expectancy and ultimate use;
- estimated capital, operating and maintenance costs, including closure and post-closure maintenance;
- haulage costs; and
- environmental, social and economic impacts;

The study should then recommend the preferred site and backup site(s).

7.5.2 Responsibility

The study should evaluate the options for administration and operation of various disposal system components. With regard to operation of sites and facilities, consideration should be given to the training and certification of operational personnel. One option that is recommended is the "Managing Landfill Operations" Training Course, sponsored by GRCDA.

7.5.3 Thermal Treatment

Thermal treatment facilities will normally have been evaluated under recovery options, but there may be situations where thermal treatment of residues to reduce volume and/or toxicity prior to landfilling may be desirable. If so, options related to technology, responsibility for administration and operation, phasing schedule, volume and type of solid waste accepted and location should be evaluated according to

- opportunity for recovery of materials or energy;
- total capital, operating and maintenance costs;
- funding sources and cost recovery mechanisms; and
- environmental, social and economic impacts.

These options should not include open burning, a practice which will be phased out over time. The study should examine ways to eliminate this practice, in regions where it currently occurs, with special consideration given to transfer stations, as noted in the following section.

7.5.4 Collection/Transfer System

A major consideration in rural or low-density areas is the replacement of small landfill sites with transfer stations, and the study should review and make use of the report on this subject prepared under contract to the Ministry of Environment.

Options related to design and location of solid waste transfer stations should be evaluated according to but not necessarily limited to the following:

- land requirements and acquisition;
- cost to users;
- security features, including denial of access to wildlife and domestic dogs;
- provision of deposit/storage areas for recyclables, household hazardous waste and nuisance solid wastes;
- size of collection vehicles required;
- capital, operating and maintenance costs; and
- environmental, social and economic impacts.

Other collection system options are more relevant in urban areas, and include improvement or modification of existing solid waste collection routes or equipment, particularly in light of reduced volumes as a result of source separation recycling programs. Coordination of solid waste pickup with that for recyclables should also be considered, along with bylaws and regulations controlling solid waste collection.

7.5.5 Involvement with Industry, Adjacent Jurisdictions and Other Levels of Government

This analysis should examine possibilities for joint operation or cost-sharing of thermal treatment or landfill facilities with industry or local governments. There may be situations where solid waste generators in one jurisdiction are much closer to a disposal facility in another jurisdiction than to one in their own. As for involvement with other levels of government, provincial programs may be available for the disposal of certain types of nuisance solid waste. In this case, the evaluation should be concerned with the options for collection, storage and transportation of such solid waste to the provincial facilities.

7.5.6 Financial Evaluation

The study should first estimate the total capital, operating and maintenance cost of residual management facilities over their anticipated lifespan and for the closure and post-closure stages. A model designed under contract to the Ministry for determining the true cost of landfills should be utilized. Funding methods should then be examined, along with cost recovery mechanisms such as sale of products or energy and tipping fees.

7.5.7 Phasing Schedule

The study should examine the possibilities for flexibility in the installation or expansion of residual management capacity, in order to respond to changing technology or solid waste volume and character.

7.5.8 Impacts

The study should estimate the environmental, social and economic impacts of all residual management options and facilities, and describe possible mitigation and amelioration measures.

7.5.9 Monitoring Disposal of Solid Waste

Knowledge of the weight and nature of the solid waste requiring disposal is essential not only for setting priorities for future higher level management strategies, but for evaluating the effectiveness of the Plan in meeting its goal. The primary evaluation criterion will be the change in the per capita generation rate of solid waste requiring disposal, expressed in kilograms/person/day. The study should therefore examine options for describing and weighing of all solid waste brought to regional disposal sites or facilities, including small, remote sites. In regard to the latter issue, the study should review and make use of the report on this subject prepared under contract to the Ministry. In regard to the general describing and weighing of solid waste, the study should determine whether a standard provincial procedure has been established, and if so, examine the adaption of the procedure to the local situation.

7.6 FINAL REPORT

The final report of the Stage 2 study should include a set of recommended options which satisfy the criteria in the *Requirements for Regional Solid Waste Management Plans* . The report should also identify all costs and impacts of the various options, and identify funding requirements, including the need for financial assistance from the provincial government. The report should also include the rationale for why a particular recommendation was made, and why other alternatives were not chosen or were recommended for deferral in accordance with an implementation schedule.

STAGE 3 PLAN PREPARATION AND ADOPTION

The comments in this part of the Guide are intended to provide direction to regional district boards in the interpretation of certain sections and provisions of the Requirements of Regional Solid Waste Management Plans. *This document is hereinafter referred to as the "Requirements", and where reference is made to sections of it, they are shown in italics .*

8. PROVINCIAL GOAL AND STRATEGY

8.1 PROVINCIAL REDUCTION GOAL

The goal of the Municipal Solid & Biomedical Waste Strategy is a 50 percent reduction in the weight of solid waste requiring disposal by the year 2000, and an interim reduction goal of 30 percent by 1995 . It is important to recognize that these goals are for the provincial waste

stream, and the contribution to the provincial waste stream varies tremendously from region to region. The reduction goals specified by *Section 1* of the Requirements should therefore be viewed as "soft" goals; the more important goal is the fostering of the attitude that the amount of solid waste requiring disposal should be reduced to the greatest extent possible consistent with community resources and the nature of the regional solid waste stream. Thus, a regional solid waste management plan will be evaluated more according to how much effort it proposes be made to reduce each portion of the regional solid waste stream than to its achievement of an absolute percentage reduction.

In addition, regional goals will be complemented through federal and provincial reduction initiatives in packaging and the recycling of beverage containers, nuisance products such as tires, and household hazardous waste.

8.2 EXPLANATION OF 5R STRATEGY

As noted in the Preface, the Provincial Strategy is based on the sequential hierarchy of the 5R's: reduce, reuse, recycle, recover and residual management. In the context of *Section 1(1)* of the Requirements, the practical meaning of "sequential hierarchy" is as follows:

- The first priority of effort is to **reduce** by as much as possible the amount or toxicity of material that enters the solid waste stream and also the impact on the environment of producing it in the first place, then to **reuse** a material or product as many times as possible before it enters the solid waste stream. This effort involves not only the redesign of products and packaging but also fundamental shifts in consciousness and lifestyle patterns. Educational and promotional campaigns and the setting of examples are more important at this level of the hierarchy than the application of existing or new technology.

- The next priority of effort is to **recycle** as much material as possible, and this effort completes the shift in consciousness and lifestyles to personal responsibility for proper handling of the solid waste one generates. Educational/promotional programs and setting of examples are still important, but equal importance is given to collection and remanufacturing programs and technologies.

- The next priority of effort is to **recover** as much material and/or energy from the solid waste stream as possible through the application of technology. This element depends on the nature of the solid waste stream, the availability of technology, demand for its products, political acceptability and the environmental, social and economic impact of applying that technology.

- The final priority of effort is to provide safe and effective **residual management**, once the solid waste stream has been reduced in each of the above stages, through the application of technology in the form of well-designed and secure landfills. In the case of some areas or for certain classes of solid waste, thermal treatment may first be applied to change chemical properties, reduce volume and/or generate energy.

In each of the first three priorities, "as much...as possible" will depend on the jurisdiction involved, according to its location and ability to make changes in the system; the nature of the solid waste stream; the distance to markets for recyclables, and the availability of capital and technology.

Another way to approach the strategy is for the regional community to ask the following series of questions for each product or material in its solid waste stream:

1. Do we need to produce or use this product or material in the first place? If "no", what can we do about it at our level?
2. If "yes", can the need for the product, and/or the amount or toxicity of material which goes into it and its packaging be reduced, and what can we do about it at our level?
3. Can this material be recycled or be designed to be recycled, and how much can we do at our level?
4. Can this material or its energy be recovered from our solid waste stream rather than recycled, and is this the best approach available to us at present?
5. How can we safely dispose of the residue of materials that at present can't be recycled or recovered?

In asking these or similar questions, it is necessary to look at the whole solid waste management system, to ensure, according to our present knowledge, that the kind or degree of effort made at one level do not result in unacceptable cost at another level in environmental, social or economic terms. For example, an undue emphasis on reusability may result in higher energy costs in production, transportation and processing compared to an alternative which is recyclable.

9. SOLID WASTE STREAM TARGETS AND MANAGEMENT STRATEGIES

Section 9 of the Requirements calls for the matching of policies and management strategies to targeted levels of the solid waste stream, including sources, classes and types of solid waste. Waste sources include residential, sub-categorized by single family, multi-family, and rural; and institutional/commercial/industrial (ICI). Waste classes include materials such as metal, paper, compostables, glass, rubber, and construction debris. Waste types include specific kinds of waste in a given class, including, with reference to the preceding list of classes, aluminum cans, ledger paper, kitchen food scraps, clear glass bottles, scrap tires and gypsum. Thus, the sum of each level comprises the whole of the solid waste stream.

Management strategies will follow a similar hierarchy, with some directed to waste sources such as ICI, some to waste classes such as office paper, and some to waste types such as office OCC.

For each target, the management strategy itself will consist of levels based on each of the 5Rs. The Plan should show both the projected contribution of each of the Rs to the management of each target, and a summation of these contributions for all levels of targets. Finally, the Plan should describe the manner in which the phasing of management strategies over time may change the contribution of each of the first 4 Rs in reducing the amount of waste requiring disposal over the term of the Plan.

Plans will be evaluated not according to the format for describing these management strategies, but according to whether or not the format facilitates evaluation of the compliance of the Plan with the Requirements, particularly *Sections 9,10 and 11 thereof*. This achieved, management strategies may be organized and the plan structured in the way most suitable for the nature of the Plan area's solid waste stream, the pattern of strategies, and the preferred style of the Regional District.

10. OPERATIONAL PLANS

Following adoption of the Plan, regional district staff, in cooperation with the Regional Waste Manager, will prepare operational plans in accordance with the approval letter from the Minister of Environment. The list of sites and facilities for which operational plans will be prepared is to be identified in the Plan and will normally include all sites currently operating under a Waste Management Permit, although the Regional Waste Manager may require retention of the Permit in certain circumstances. The list should also include new sites or facilities, including transfer stations, for which a potential for environmental impact exists.

The operational plans will specify design, operating, maintaining, monitoring and closure/post-closure requirements and guidelines. In particular, operational plans for residual management sites and facilities will be based on and evaluated according to the prevailing objectives for municipal solid waste incinerators and landfills. The Emission Objectives for Municipal solid Waste Incinerators are now in final draft form and available for use, while the Objectives for Municipal Solid Waste Landfills are currently in preliminary draft form and should be finalized within the current calendar year.